

EXHIBIT B

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

RUSSELL DOVER, HENRY HORSEY)
CODY RANK, AND SUZETTE PERRY,)
On behalf of themselves and all others similarly)
situated,)

Plaintiffs,)

v.)

BRITISH AIRWAYS, PLC (UK),)

Defendant.)

) Case No. 1:12-cv-05567-MKB-MDG

REBUTTAL REPORT OF ANDREW K. G. HILDRETH, Ph.D

August 28, 2015



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Russell Dover, et al v. British Airways, PLC (UK),
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I. INTRODUCTION

1. I am currently a Managing Director with Alvarez & Marsal LLP in their Global Forensic and Dispute Services (“Alvarez & Marsal” or “A&M”). Alvarez & Marsal is a privately held consulting firm located around the globe. I undertake expert work in litigation and arbitration on matters related to economics, statistics, and survey work. I have been retained in a number of cases related to such matters, and in particular, concerning regression analysis.
2. This report concerns the matter of *Russell Dover, Henry Horsey, Cody Rank and Suzette Perry, Plaintiffs v. British Airways, PLC (UK), Defendant*.
3. I have been engaged to file this expert report on behalf of the Defendant: British Airways, PLC (UK), henceforth “BA.”
4. My hourly rate is \$625 per hour. The hourly rates for A&M personnel assisting me in connection with my work on this matter are between \$230 and \$450. I, personally, have undertaken approximately 60 hours of work including attendance at meetings and depositions. No portion of the compensation related to my work, or the work of any A&M staff, is dependent on the opinions rendered or on the outcome of this matter.

II. PROFESSIONAL QUALIFICATIONS

5. I am a Managing Director of Alvarez & Marsal, resident in the London and New York offices. I was previously an Associate Professor in the Department of Economics at the University of California-Berkeley. At the same institution, I was previously Research Director of the California Census Research Data Center

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(“CCRDC”) and a Professorial Research Fellow at the Survey Research Center (“SRC”). I received my formal training in economics and statistics at the University of Cambridge, obtaining a Ph.D. My training and expertise include the area of applied econometrics, a well-recognized science that uses mathematical equations to infer the relationship between economic variables. Arguably the leading journal in econometrics describes the science as: “... the quantitative analysis of actual economic phenomena based on the concurrent development of theory and observation, related by appropriate methods of inference.”¹ An introductory economics textbook describes econometrics as allowing economists “to sift through mountains of data to extract simple relationships.”²

6. I taught statistics and econometrics both in the United States and in Europe for approximately 15 years at both the undergraduate and postgraduate levels. As part of my position in the Department of Economics at the University of California-Berkeley, I taught statistics and econometrics to both undergraduate and graduate students. I have published more than 25 articles and papers (mainly in peer reviewed publications) that have examined sampling and its implications for providing representative statistics. I have also lectured at international conferences (including the U.S. National Academy of Science and the British Academy) concerned with statistical and measurement issues. I am a Fellow of the Royal Statistical Society.

¹ Paul A. Samuelson, T. C. Koopmans, and J. R. N. Stone (1954). “Report of the Evaluative Committee for Econometrica,” *Econometrica* 22(2), p. 142.

² Paul A. Samuelson and William D. Nordhaus, 2004. *Economics*. 18th ed., McGraw-Hill, p. 5.

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7. Previously, as Research Director at the CCRDC and as a Professorial Research Fellow at the SRC, I would oversee research dedicated to examining economic issues concerning the collection (sample surveys) and use of data for economic and social modeling. Over the past 15 years, I have directed a number of projects that have required me to predict the answers to complex questions utilizing econometric modeling techniques. I have designed and advised on econometric modeling for the U.S. Census Bureau, California Health and Human Services (CHHS) agency, the Office for National Statistics (ONS) in the United Kingdom, the Australian Bureau of Statistics and Eurostat, the Statistical Agency for the European Commission.
8. More specifically, and with direct relevance to the matter at issue in this case, I have been an economic expert in U.S. class action litigation cases where econometric modeling has been required. In such instances, an econometric model can help establish whether a relationship between two variables (or more) exists; the “sign” of that relationship (whether positive or negative); and if that relationship is statistically significant (and the degree of confidence that can be attached to that relationship).
9. My curriculum vitae, which is attached as Appendix A, describes my professional credentials, including publications and prior testimony as required by the Federal Rules of Civil Procedure.

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III. BACKGROUND

10. I was contacted by my colleague, Marc Sherman, who requested that I perform statistical analysis in response to certain comments made by Dr. Jonathan Arnold in his July 15th reply report (“Reply Report”). Specifically, among other things, Dr. Arnold stated in paragraph 10 of his Reply Report that “the relationship between the changes in YQ Charges and changes in fuel prices or costs is weak” and in paragraph 40 that BA’s fuel surcharge “did not move with fuel prices or costs.” Dr. Arnold also opined in paragraph 5 that Mr. Sherman had “implicitly concede[d] that the [fuel surcharges] were not ‘closely related’ to fuel costs.” In response to those comments, Mr. Sherman sought my assistance in performing statistical (econometric) analyses on the relationship between BA’s fuel surcharges and the cost or price of fuel as well as my opinion as to whether BA’s fuel surcharge was “a supplemental charge that is reasonably related to or based upon the cost or price of fuel.”³

11. In paragraphs 51 and 55 of their Amended Complaint, the plaintiffs alleged that “Statisticians refer to the strength of a relationship between the changes in variables as “r-squared.” ... A comparison of the fluctuating cost of fuel to the “fuel surcharges” that BA imposed between 2007 and 2012 (on flights from the east coast to London as well as from the west coast to London) reveal that the r-squared values ranged between approximately .15 to .4. In other words, BA’s ‘fuel surcharges’ bore little relationship to – and were not based upon – charges

³ Corrected Rebuttal Report of Marc B. Sherman, dated June 25, 2015, ¶25 (citing Judge Dearie’s November 7, 2013 decision on the Motion to Dismiss, Def. Ex. 170).

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(sic) in the price of fuel.”⁴ Mr. Sherman asked me to review the analysis on which the plaintiffs relied to make those assertions and opine as to the accuracy and significance of that analysis.

12. In addition, I was asked to opine as to whether or not the fuel surcharge and fuel price data relied upon by Marc Sherman and Jonathan Arnold in their respective expert reports exhibited any degree of correlation. For example, in his Reply Report, Jonathan Arnold states: “As a matter of economics, the YQ Charges cannot be considered fuel surcharges. In order to be considered fuel surcharges, the YQ Charges must reflect changes in either the price of fuel or BA’s cost of fuel.”⁵ If such a proposition was true, I questioned why Dr. Arnold failed to estimate or test that proposition with statistics.⁶

IV. MATERIAL REVIEWED

13. To undertake my analysis, I was provided with the following material. In terms of documents, I was provided with:

- Amended Class Action Complaint: *Russell Dover, Henry Horsey, Cody Rank, and Suzette Perry, Plaintiffs vs. British Airways, PLC (UK), Defendant*, Case No: 1:12-cv-05567-MKB-MDG, United States District Court for the Eastern District of New York, filed January 9, 2015;

⁴ Plaintiffs’ Amended Complaint, dated January 9, 2015, ¶¶ 51, 55.

⁵ Expert Reply Report of Jonathan I. Arnold, Ph.D, dated July 15, 2015, ¶ 3.

⁶ Dr. Arnold repeatedly alludes to “a matter of economics” in his report without ever stating or citing the theory, publication (peer reviewed or otherwise), or treatise from which his matter of economic opinion is derived. Simply espousing that something is “a matter of economics” does not make it necessarily so. Further, I would have expected that an economist, especially one trained at the University of Chicago, would have used basic tests (as described here in my report) to test the correlation between BA’s fuel surcharge – or YQ charge – and the price or cost of the jet fuel kerosene.

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- Expert Report of Jonathan I. Arnold, Ph.D, May 4, 2015;
- Expert Reply Report of Jonathan I. Arnold, Ph.D, July 15, 2015;
- Corrected Rebuttal Report of Marc. B. Sherman, June 25, 2015;
- BA-PLTF-000091.

14. In terms of data, I was provided with:

- Figurebook.xlsx (an Excel book containing the data behind the results described in Dr. Arnold's Reply Report and Mr. Sherman's Rebuttal Report);
- Plaintiffs Data for Regression – A&M Recreation.xlsx (an Excel book containing Alvarez & Marsal's recreation of the data reportedly used in the plaintiffs' Amended Complaint).

15. A full list of all materials relied upon is provided in Appendix B.

16. All models were run in STATA 13 and data transfers were enacted with StatTransfer.

V. ECONOMETRIC METHOD

17. The basic tool for econometrics is the linear regression model. In modern econometrics, other statistical tools are frequently used, but linear regression is still the most frequently used starting point for an analysis.⁷ Estimating a linear regression on two variables can be visualized as fitting a line through data points representing paired values of the independent and dependent variables. In this

⁷ For example, see: Gujarati, D.N. and Porter, D.C. *Essentials of Econometrics*, 4th ed., McGraw-Hill, 2010.

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instance, the two variables of interest are the BA fuel surcharge (however it is defined) and the price or cost of jet fuel kerosene (however it is defined).

18. The relationship between the two variables would be a bi-variate regression model: where the dependent variable (the BA fuel surcharge) is determined by a constant plus some factor of the jet fuel kerosene. The constant and the factor on the jet fuel kerosene are unknown parameters to be estimated.

19. As part of the test statistics that a regression model may produce, one of them is the coefficient of determination; which is otherwise known as R^2 (also referred to as R-squared or r-squared).⁸ R^2 measures the degree to which the variation in the dependent variable (in this instance, a measure of the BA fuel surcharge) is determined by the variation in the independent variable. Here the independent variable is the price (or cost) of jet fuel kerosene. R^2 is bounded between 0 and 1. If R^2 is closer to 0, then the model (or independent variable) explains little of the variation in the dependent variable. If R^2 is closer to 1, then the model (or independent variable) explains a high percentage (directly linked to the value of R^2) of the dependent variable.

20. So, for example, when the plaintiffs' Amended Complaint claimed that "A comparison of the fluctuating cost of fuel to the 'fuel surcharges' that BA imposed between 2007 and 2012 (on flights from the east coast to London as well as from the west coast to London) reveal that the r-squared values ranged between approximately .15 to .4", they were claiming that variation in fuel costs (or prices)

⁸ Gujarati, D.N. and Porter, D.C. *Essentials of Econometrics*, 4th ed., McGraw-Hill, 2010, p. 71.

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only explained 15 to 40 percent of the variation in BA's fuel surcharges. As I will explain further below, this statement was false and resulted from an improper estimation.

21. A related statistic to R^2 (the coefficient of determination) is the coefficient of correlation, which is usually referred to as R . The coefficient of correlation (which is the square root of R^2) measures the strength of the linear relationship between two variables: in this instance the fuel surcharge and the price (or cost) of the jet fuel kerosene. R (which can also be computed separately) is also bounded in absolute value between 0 and 1.⁹ If R is close to 0 then the two variables are not correlated; there is a poor linear relationship between them. If R is close to 1, then the two variables can be described as having a close linear relationship; they are correlated with each other.

22. It should be noted that both R^2 and R are calculated from the linear regression model. Another way to describe if two variables are linearly correlated would be to use a Spearman's correlation coefficient.¹⁰ Spearman's simply estimates a similar coefficient of correlation (ρ) that is bounded between 0 and 1 in the same way as the coefficient of correlation (R) above. The only difference is that the Spearman's coefficient does not require estimating a regression model beforehand.

⁹ Gujarati, D.N. and Porter, D.C. *Essentials of Econometrics*, 4th ed., McGraw-Hill, 2010, p. 74.

¹⁰ Spearman C (1904). "The Proof And Measurement Of Association Between Two Things". *American Journal of Psychology*. 15, pp. 72–101.

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23. In total, I estimated regression models and Spearman's correlation coefficients for three sets of data which all assessed the same relationship; namely, whether or not BA's fuel surcharge was correlated with the price (or cost) of jet fuel kerosene during the putative class period.

24. The three sets of data I used in the estimation were from: (1) the analysis described in the plaintiffs' Amended Complaint, (2) Mr. Sherman's report, and (3) Dr. Arnold's May 4th report ("Expert Report"). The results of estimation are contained in Tables 1, 2, and 3 respectively. In summary, irrespective of which set of data is used, BA's fuel surcharge is reasonably correlated with the price (or cost) of jet fuel kerosene.

VI. RESULTS

A. Plaintiffs' Amended Complaint Data

25. The first set of results, Table 1, sets forth my attempt to replicate and verify the results in the plaintiffs' Amended Complaint. In total, three sets of results were run. First, I attempted to replicate the results reported in the plaintiffs' Amended Complaint. I then estimated the same models used by the plaintiffs two additional times, but I first corrected for an error in the estimation that caused the results to be skewed.

26. The first set of results on Table 1 replicate (as far as possible given the paucity of the explanation of the estimation in the plaintiffs' Amended Complaint) the results claimed in paragraph 55 of the Amended Complaint. The results estimate

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the linear regression model (that also estimates R^2 and R) and Spearman's ρ for four of BA's fuel surcharges: (a) LHR-JFK Economy fuel surcharge against the Jet Kerosene New York Barge Spot price, (b) LHR-JFK First fuel surcharge against the Jet Kerosene New York Barge Spot price, (c) LHR-SFO Economy fuel surcharge against the Jet Kerosene San Francisco CA Pipeline price, and (d) LHR-LAX First fuel surcharge against the Jet Kerosene Los Angeles CA Pipeline price.

27. The first set of results, denoted "Replication of Plaintiffs' Amended Complaint," show R^2 values between 0.140 and 0.414. This is approximately the range given in the plaintiffs' Amended Complaint. However, this estimation was not performed correctly thereby rendering the result inaccurate. While the price of jet fuel kerosene was provided in U.S. dollars, the price of BA's fuel surcharge was provided in pounds sterling. Using different currencies that relate by varying exchange rates over time introduces extra variability into the estimation (meaning a third variable) since the dependent and independent variables are not measured in the same unit of exchange. This causes the estimated R^2 statistics to be lower because they are measuring more than just the relationship between jet fuel kerosene and BA's fuel surcharge.

28. This was a rudimentary error, which should have been caught by any economist performing a first order check of the estimation. Similarly, I find it mystifying that Dr. Arnold's expert reports do not contain one single coefficient of correlation, determination or Spearman's rank to support his opinions.

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29. Therefore, the results quoted in the plaintiffs' Amended Complaint are inaccurate and do not properly characterize the relationship between jet fuel kerosene and BA's fuel surcharge.
30. I have also provided the coefficient of correlation – R – and Spearman's ρ for the plaintiffs' inaccurate estimation. Despite the error, you will note that the degree of correlation between BA's fuel surcharge and the jet kerosene prices is reasonably high (around 60 percent) for the economy class routes.
31. The second set of results, denoted "Replication with \$ rates" provides the R^2 , R and ρ results for the same four fuel surcharges, but converted into US dollar rates using the implied sterling-dollar exchange rate from the plaintiffs' Amended Complaint data.¹¹ Now that the fuel surcharge and the jet fuel kerosene prices are in the same unit of exchange (U.S. dollars), you can see that the values for R^2 are considerably higher and range from 0.322 to 0.701; more than double the estimate asserted in the plaintiffs' Amended Complaint for some routes.
32. Even more striking are the results for correlation between BA's fuel surcharge and the jet fuel kerosene price. None of the correlation coefficients – R – are below 0.5; in other words, for all routes, the price of jet fuel kerosene explains over 50 percent of the movement in BA's fuel surcharge; and for the economy routes, that percentage rises to over 70 percent.

¹¹ The implied sterling – dollar exchange rate was calculated in the following manner. An unweighted average BA fuel surcharge in sterling was calculated using the columns "LHR –JFK Economy Fuel Surcharge in Sterling," "LHR-JFK First/Club Fuel Surcharge in Sterling," "LHR-SFO Economy Fuel Surcharge in Sterling" and "LHR-LAX First/Club Fuel Surcharge in Sterling." The dollar average for the fuel surcharge – labelled "BA Fuel Surch'ge Averaged (USD)" in BA-PLTF-000091 – was then divided by the weighted BA fuel surcharge in sterling.

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33. The third set of results, denoted “Replication with \$ day rates” gives the R^2 , R and ρ results for the same four fuel surcharges, but converted BA’s fuel surcharges into U.S. dollar rates using the close of trading day sterling-dollar exchange rate for London from Bloomberg. The results show no noticeable difference from using the implied exchange rate from the plaintiffs’ Amended Complaint data.

B. Mr. Sherman’s Data

34. The second set of results, Table 2, set forth my examination of the extent of correlation between BA’s fuel surcharge and the price of jet fuel using data relied upon by Mr. Sherman in Chart 4 of his report (which was also reproduced in a re-scaled form as Figure 2 in Dr. Arnold’s Reply Report). In other words, the estimates of the extent of correlation provide a numeric value to the depiction given in Chart 4 of Mr. Sherman’s report.

35. The results in Table 2 show the degree of correlation for each fuel surcharge listed by Mr. Sherman: Long Haul < 9 Hrs World Traveller against the Weighted Spot Price of Jet Fuel, Long Haul < 9 Hrs World Traveller Plus against the Weighted Spot Price of Jet Fuel, Long Haul < 9 Hrs Club World & First against the Weighted Spot Price of Jet Fuel, Long Haul > 9 Hrs World Traveller against the Weighted Spot Price of Jet Fuel, Long Haul > 9 Hrs World Traveller Plus against the Weighted Spot Price of Jet Fuel, Long Haul > 9 Hrs Club World & First against the Weighted Spot Price of Jet Fuel, Short Haul Euro Traveller against the Weighted Spot Price of Jet Fuel, and Short Haul Club Europe against the Weighted Spot Price of Jet Fuel.

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36. The results in Table 2 unequivocally demonstrate that BA's fuel surcharges were both highly correlated with the weighted spot price of jet fuel, and that the variations in BA's fuel surcharges were highly determined by the spot price of jet fuel. In terms of correlation, not one coefficient, either measured as the coefficient of correlation or Spearman's ρ , falls below 0.84. In terms of the coefficient of determination, not one estimate falls below 0.70. These results mandate the conclusions, from a statistical perspective, that BA's fuel surcharge was reasonably related to the weighted spot price of jet fuel.

C. Dr. Arnold's Data

37. The third set of results, Table 3, set forth my examination of the extent of correlation between BA's fuel surcharge and the price of jet fuel using data relied upon by Dr. Arnold in Figure 1 of his Expert Report. In other words, the estimates of the extent of correlation provide a numeric value to the depiction given in Figure 1 of Dr. Arnold's Expert Report.

38. The results on Table 3 show the degree of correlation for each of BA's fuel surcharges listed by Dr. Arnold: Long-haul < 9hrs Economy Index against the Jet Fuel Index, Long-haul < 9hrs Premium Economy Index against the Jet Fuel Index, Long-haul < 9hrs Business-First Index against the Jet Fuel Index, Long-haul > 9hrs Economy Index against the Jet Fuel Index, Long-haul > 9hrs Premium Economy Index against the Jet Fuel Index, and the Long-haul > 9hrs Business-First Index against the Jet Fuel Index.

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39. The results in Table 3 unequivocally demonstrate that BA's fuel surcharges were both highly correlated with the jet fuel index, and that the variation in BA's fuel surcharges were highly determined by the jet fuel index. In terms of correlation, not one coefficient, either measured as the coefficient of correlation or Spearman's ρ , falls below 0.82. In terms of the coefficient of determination, not one estimate falls below 0.67. These results mandate the conclusions, from a statistical perspective, that BA's fuel surcharge was reasonably related to the weighted spot price of jet fuel.

VII. CONCLUSION AND OPINION

40. In my opinion, irrespective of the data used (when the fuel surcharge and jet fuel price are properly measured in the same unit of exchange), there is a high degree of correlation (over 70 percent) between BA's fuel surcharge and the price (or cost) of jet fuel kerosene. Further, the coefficient of determination, which measures the degree to which the variation in BA's fuel surcharge is determined by the variation in the price (or cost) of jet fuel kerosene, shows an equally high value.

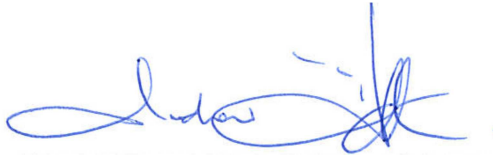
41. As such, it is my opinion that BA's fuel surcharge is not only reasonably related to the price (or cost) of jet fuel kerosene, it is highly correlated. This result applies across the fuel surcharges assessed by BA for different routes and different classes of travel as well as different time periods, and is not affected by whether one uses the plaintiffs' Amended Complaint data or the data relied upon

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by either Mr. Sherman or Dr. Arnold in their reports. There is, in my opinion, and as a matter of economics (as referenced with the economic and econometric texts cited herein), no basis for the plaintiffs' claim that "... BA's "fuel surcharges" bore little relationship to – and were not based upon – charges in the price of fuel."¹² Moreover, Dr. Arnold is wrong when he opines that "... the relationship between the changes in YQ charges and changes in fuel prices or costs is weak" and that BA's fuel surcharge "... did not move with fuel prices or costs."¹³

42. I declare under the penalty of perjury that the foregoing is true and correct.

VIII. SIGNATURE



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¹² Plaintiff's Amended Complaint, dated January 9, 2015, ¶55.

¹³ Expert Reply Report of Jonathan I. Arnold, Ph.D, dated July 15, 2015, ¶ 40.

Table 1: Estimates of Correlation using Plaintiff's Amended Complaint Data.

	R2	R	Spearman rho
Replication of Plaintiff's Amended Complaint			
lhr-jfk-econ/Jet Kerosene NY Barge Spot	0.414	0.643	0.570
lhr-jfk-first/Jet Kerosene NY Barge Spot	0.174	0.417	0.430
lhr-sfo-econ/Jet Kero San Francisco CA Pipeline	0.344	0.587	0.520
lhr-lax-first/Jet Kero Los Angeles CA Pipeline	0.140	0.374	0.430
Replication with \$ rate*			
lhr-jfk-econ/Jet Kerosene NY Barge Spot	0.701	0.837	0.830
lhr-jfk-first/Jet Kerosene NY Barge Spot	0.406	0.637	0.500
lhr-sfo-econ/Jet Kero San Francisco CA Pipeline	0.518	0.720	0.680
lhr-lax-first/Jet Kero Los Angeles CA Pipeline	0.322	0.567	0.510
Replication with daily \$ rate**			
lhr-jfk-econ/Jet Kerosene NY Barge Spot	0.710	0.843	0.710
lhr-jfk-first/Jet Kerosene NY Barge Spot	0.366	0.605	0.490
lhr-sfo-econ/Jet Kero San Francisco CA Pipeline	0.565	0.752	0.720
lhr-lax-first/Jet Kero Los Angeles CA Pipeline	0.311	0.558	0.490

Definitions

R2 - coefficient of determination: a measure of the variance in the dependent variable explained by the variance in the independent variable.

R - coefficient of correlation: a measure of the strength and direction of the linear relationship between a dependent and independent variable.

Spearman's rho coefficient: a measure of the strength and direction of the linear relationship.

* \$ rates are the inferred rates from the (BA Fuel Surch'rg e Averaged (USD)) divided by the average of the fuel surcharge (sterling) across the 4 routes as described in the report.

** \$ day rates are the closing daily US\$-£sterling rates on London for the relevant day.

Table 2: Estimates of Correlation using Mr. Sherman's Data.

	R ²	R	Spearman's rho
Long Haul < 9 Hrs World Traveller/Weighted Spot Price of Jet Fuel	0.874	0.935	0.918
Long Haul < 9 Hrs World Traveller Plus/Weighted Spot Price of Jet Fuel	0.850	0.922	0.908
Long Haul < 9 Hrs Club World & First/Weighted Spot Price of Jet Fuel	0.807	0.898	0.901
Long Haul > 9 Hrs World Traveller/Weighted Spot Price of Jet Fuel	0.858	0.926	0.906
Long Haul > 9 Hrs World Traveller Plus/Weighted Spot Price of Jet Fuel	0.819	0.905	0.899
Long Haul > 9 Hrs Club World & First/Weighted Spot Price of Jet Fuel	0.799	0.894	0.899
Short Haul Euro Traveller/Weighted Spot Price of Jet Fuel	0.709	0.842	0.859
Short Haul Club Europe/Weighted Spot Price of Jet Fuel	0.711	0.843	0.850

Definitions

R² - coefficient of determination: a measure of the variance in the dependent variable explained by the variance in the independent variable.

R - coefficient of correlation: a measure of the strength and direction of the linear relationship between a dependent and independent variable.

Spearman's rho coefficient: a measure of the strength and direction of the linear relationship.

Table 3: Estimates of Correlation using Dr. Arnold's Data.

	R2	R	Spearman's rho
Long-haul < 9hrs Economy Index/Jet Fuel Index	0.831	0.912	0.866
Long-haul < 9hrs Premium Economy Index/Jet Fuel Index	0.745	0.863	0.839
Long-haul < 9hrs Business-First Index/Jet Fuel Index	0.701	0.837	0.826
Long-haul > 9hrs Economy Index/Jet Fuel Index	0.811	0.901	0.869
Long-haul > 9hrs Premium Economy Index/Jet Fuel Index	0.687	0.829	0.821
Long-haul > 9hrs Business-First Index/Jet Fuel Index	0.672	0.820	0.821

Definitions

R2 - coefficient of determination: a measure of the variance in the dependent variable explained by the variance in the independent variable.

R - coefficient of correlation: a measure of the strength and direction of the linear relationship between a dependent and independent variable.

Spearman's rho coefficient: a measure of the strength and direction of the linear relationship.

APPENDIX A
ANDREW K. G. HILDRETH, Ph.D C.V.

Education:

B.A. (First Class Honours), Economics, City of London Polytechnic.
Ph.D, Economics, University of Cambridge.

Professional History:

2013 to present	<i>Partner/Managing Director</i> , Alvarez & Marsal, One Finsbury Circus, London EC2M 7EB, UK. <i>Fellow</i> , Royal Statistical Society.
2009 -2013	<i>Director</i> , AlixPartners LLP, 20 North Audley Street, London UK.
2007 -2009	<i>Vice President</i> , CRA International, 99 Bishopsgate London, UK.
2001 -2007	<i>Consultant to the Firm</i> , Econ One Research Inc., 601 W.Fifth Street, Los Angeles, CA, USA.
1999 -2007	<i>Director of Research</i> , California Census Research Data Center, University of California-Berkeley, CA, USA. <i>Associate Professor</i> , Department of Economics, University of California-Berkeley, Berkeley, CA, USA. <i>Professorial Researcher</i> , Survey Research Center, University of California-Berkeley, Berkeley, CA, USA.
2003	<i>CNRS-Berkeley Overseas Fellowship</i> , CREST-INSEE, Malakoff Cedex, France.
2003	<i>J.Fish & Lillian Smith Chair in Free Market Economics</i> , Department of Economics, Brigham Young University, Provo, UT, USA.
1998 -1999	<i>Visiting Professor</i> , Department of Economics and Center for Labor Economics, University of California-Berkeley, CA, USA.
1994 -1999	<i>Lecturer</i> , Department of Economics, University of Essex, UK.
1994	<i>Visiting Professor</i> , Graduate School for Industrial Administration, Carnegie-Mellon University, Pittsburgh, PA, USA.
1993	<i>Visiting Lecturer</i> , Department of Economics, University of Melbourne, Economics and Commerce Building, Victoria, Australia.
1992 -1994	<i>Senior Research Officer</i> , Department of Economics & ESRC Research Centre for Micro-Social Change, University of Essex, UK.
1990 -1992	<i>Research Fellow</i> , Institute of Economics and Statistics, University of Oxford, UK.

Case work (cases as expert or expert witness role):

Anti-trust

Lee Eddins D/B/A Video Empire; et al.,vs. Sumner Redstone; Viacom Inc.; Blockbuster Inc.; Paramount Home Video, Inc.; Buena Vista Home Entertainment, Inc.; Columbia Tri-Star Home Video, Inc.; Universal Studios Home Video, Inc.;

and Twentieth Century Fox Home Entertainment, Inc. vs Blockbuster Video. (Class Action on discriminatory pricing by movie studios in favor of Blockbuster. Estimates of extent of damages to non-Blockbuster video stores). Plaintiff. Testimony given.

Department of Justice vs Atofina (US). (Anti-trust pricing by Atofina in terms of non-competitive practices and pricing of PVC hardeners). Defence.

American Express vs Visa, MasterCard, et al. (Restrictive practices private litigation). Representing plaintiffs seeking damages for defendants restrictive practices in the US credit card market. Private litigation following on from Department of Justice legal action against Visa and MasterCard restrictive rules. Plaintiff. See here:

<http://www.nytimes.com/2008/06/26/business/26credit.html>

Dominant position market analysis of the nuclear reprocessing industry (in Europe) following the sale of Sellafield SLC for client. Report submitted to the European Commission via Eversheds LLC.

Assessment of 'Cover Bidding' practices for client in response to United Kingdom Office for Fair Trading (OFT) Letter of Intent on the construction industry. Results reported to client via Linklaters LLP.

Consulting expertise to large UK bank to answer regulatory concerns on market abuse in the unauthorized overdraft charges (UOC), credit card credit limits, and PPI (Payment Protection Insurance) markets. Reports filed with the Competition Commission.

http://www.competitioncommission.org.uk/inquiries/ref2010/ppi/remittal/pdf/review_of_accents_final_with_addendum_21_oct_2010.pdf

Consulting expertise to British Telecommunications concerning survey evidence for market definition in the Wholesale Calls market in relation to an Ofcom Statement of Objections concerning accusations of a margin squeeze by Thus and Gamma.

http://stakeholders.ofcom.org.uk/enforcement/competition-bulletins/opencases/all-open-cases/cw_988/

National Grid Electricity Transmission vs ABB, Siemens, Alstom & others (follow-on damages claim by National Grid following a cartel finding in the GIS switchgear market by the European Commission.) UK High Court. Defence.

<http://www.monckton.com/docs/library/NGETvABBAndOthers.pdf>

Litigation

Obayashi Corporation vs. Los Angeles Metropolitan Transit Authority (LAMTA). (Estimates of cost over-run and productivity in the mining and construction of the LA Metro Line tunnel). Defence.

Various vs Pittsburgh Corning Corporation. (Representing the Insurance companies in estimates of the extent and cost of damages for future litigants). Defence.

Various vs. Halliburton (DII). (Representing the Insurance companies in assessment of the bankruptcy filing of DII in response to asbestos litigants. 'Event analysis' on the value of the bankruptcy declaration to the company as a means of settling all pending and future asbestos claims). Defence.

GFTA vs. Bank of New York (Representing GFTA – a foreign exchange fund – in a breach of contract case for a Joint Venture). Work involved econometric models predicting the growth of assets under management. Plaintiff.

The Official Committee of Unsecured Creditors of Mervyn's Holdings LLC et al vs. SCSF Mervyn's Offshore Inc. & Mervyn's (US) LLC. Statistical sampling of documents according to key words to produce an estimate of the documents covered by the key word search.

Vossloh Aktiengesellschaft v Alpha Trains (UK). Breach of contract on leasing, guarantee, and maintenance of locomotives across European rail networks. Statistical evidence on the rate of failure for locomotives above the mandated threshold from the maintenance contract. Defence.

MBIA Insurance Corp vs. Various banks (e.g. Countrywide). Modelling the causation and the damages elements to claims by MBIA that the banks had misled the insurance company as to the degree of defaults for the residential mortgages in the Residential Mortgage Backed Securities (RMBS). Plaintiff. Current. MBIA claim that the dilution of underwriting standards caused the increased defaults. See: <http://www.bloomberg.com/news/2012-01-03/mbiawins-judgment-ruling-against-countrywide.html>

Regents of the University of California v. Edwards, Wagstaff (in their official capacity as representatives of the County of Sacramento). Sampling medical claims and estimating the liability for and the dollars owed on medical treatment at County of Sacramento hospitals. Defence.

Intellectual property

Louisiana Wholesale Drug Company, Rochester Drug Co-Operative Inc, and Meijer Distribution Inc. vs. Abbotts Laboratories and Laboratories Fournier (Intellectual Property): infringement of patent protection legislation in the development and distribution of Tricor drug for cholesterol. Plaintiffs.

Employment (incl. Executive Compensation)

Nostrum vs. Albertsons. (Overtime legislation litigation). Representing the defence – Albertsons – in the assessment of whether or not they were negligent in allowing for a sufficient overtime payment for missed lunch breaks on the part of in-store pharmacists. Defence.

Duran vs. US Bank. (Overtime legislation litigation). Representing defendants (class action) in an overtime dispute over out of hours work. Estimation of damages. Defence.
<http://www.wagehourlitigation.com/state-claims/willthe->

[california-court-of-appeal-follow-dukes-and-reject-trial-by-formula-in-class-action-trials/](http://www.courts.ca.gov/opinions/documents/S200923.PDF)
California Supreme Court: *Duran v. U.S. Bank Nat. Assn.*, 59 Cal.4th 1 (2014). Opinion:
<http://www.courts.ca.gov/opinions/documents/S200923.PDF>

Dudash vs. Lowes (Overtime legislation litigation). Representing plaintiffs (class action) in an overtime dispute over hours of work. Class certification expert. Plaintiff.

Shin vs. First Republic Bank (Overtime legislation litigation). Representing defendants (class action) in an overtime dispute over out of hours work. Estimation of damages. Defence.

Credit Suisse Securities (USA) LLC vs. Belanger, Eggesbo. (Trader compensation and non-solicitation). Representing Credit Suisse First Boston (CSFB) in a matter regarding UBS poaching a property securities trading team). Estimation of loss for CSFB. Plaintiff.

Carpenter vs. Boeing (Discrimination case regarding pay and promotion. Analysis of wages and positions within Boeing in Wichita, Kansas.). Report submitted. Defence.

Green vs. Penske (Overtime legislation litigation). Representing defendants (class action) in an unpaid vacation (days) hours dispute. Estimation of damages. Defence.

Burakoff vs. US Bank (Overtime legislation litigation). Representing defendants (class action) in an overtime dispute over out of hours work. Estimation of damages. Defence.

Vadura vs. Paddy Murphy's Inc. (Overtime legislation litigation). Representing defendants (class action) in an overtime dispute over out of hours work. Estimation of damages. Defence.

Trahan vs. US Bank (Overtime legislation litigation). Representing defendants (class action) in an overtime dispute over out of hours work. Defence.

Mathis vs. Quicken Loans Inc., (Overtime legislation litigation). Representing defendants (class action) in a Federal overtime dispute on hours worked. Defence.

Assessment and monitoring of training in *Southern California Edison* Linesmen on behalf of the company. Report submitted.

Wrongful death/injury

Various (Individual cases: Bermudez, Chavez, Hall, M., Sparks, Thompson, Williams) vs. Alaska Airlines. (Estimates of value of life for air crash victims in Alaska Airlines Flight 261 crash at Pacifica, California, 2000). Defence.

Tallboys vs. Garuda Airlines (Mediation – expert report). (Estimates of value of life for air crash victims in Garuda Airlines crash in Indonesia, 2007). Defence.

Faith Zaman and Thomas W. Derbyshire, vs. Amedeo Holdings, Inc., PH Partners, Inc., Palace Holdings Inc., Kava Holdings, Inc., and Cedar Swamp Holdings, Inc. (Estimates of loss of career earnings from wrongful lawsuits regarding professional conduct). Plaintiffs.

Other work

Assessment of ‘fair rents’ (pricing) for the New York Rent Stabilization Authority.

European enterprise panels project (European Commission)

Authored reports

“Enterprise Panels and the European Commission’s White Paper”, Luxembourg - Office for Official Publications of the European Communities, (1994).

“UK Manufacturing Performance and the Single Market”. Confidential Report to EUROSTAT, Directorate D and Directorate General XV, for the 1996 Study on the European Internal Market.

Australian Bureau of Statistics

Service Industries and Science and Technology Section, PO Box 10, Belconnen, Canberra, ACT 2616, Australia. Work carried out: Sampling and design of the questionnaire.

PUBLICATIONS:

Journals

“Wage Bargaining, Inventories, and Union Legislation.” With M. G. Coles. *Review of Economic Studies*, 67, (2000), pp. 273–294.

“Employers, Workers, and Unions: Analysis of a Matched Firm-Worker Panel with Endogenous Sampling and Survey Response.” With S. E. Pudney. *Journal of Applied Econometrics*.

“Rent-Sharing and Wages: Evidence From Company and Establishment Panels.” With A.J. Oswald. *Journal of Labor Economics*, 15, (1997), pp. 318–337.

“Environmental Regulation and the Cost of Job Displacement.” *Industrial and Labor Relations Review*. (forthcoming).

“The Measurement of Medicaid Coverage in the SIPP: Evidence from California, 1990-1996.” With D. Card and L. Shore-Sheppard. *Journal of Economic and Business Statistics*, 22, (2004), pp. 410–420.

“Estimating the ‘True’ Cost of Job Loss: Evidence using Matched Data from California 1991–2000.” With T. von Wachter and E. Weber. Submitted: *American Economic Review*.

“The Hiring Practices of Firms: Estimates from Linked Cross-Section Employer-Worker Survey Data.” With S. E. Pudney. *Journal of Industrial Economics*, (forthcoming).

“What has Happened to the Union Wage Differential in Great Britain in the 1990’s?” *Oxford Bulletin of Economics and Statistics*, 61, (1999), pp. 5–31.

“A New Voice or a Waste of Time? Returns to Using Computers for Communication in the Workplace.” *British Journal of Industrial Relations*, 39, (2001), pp. 257–284.

“Rent-Sharing and Wages: Product Demand or Technology Driven Premia?” *Economics of Innovation and New Technology*, 5, (1998), pp. 199–226.

“Wages, Work, and Unemployment: Work History Evidence on Allocating Time between Labour Market States.” With D.T. Mortensen, S.P. Millard, and M.P. Taylor. *Applied Economics*, 30, (1998), pp. 1531-1547.

“Labor Demand and the Structure of Adjustment Costs in Japan.” With Fumio Ohtake. *Journal of Japanese and International Economies*, 12, (1998), pp. 131–150.

“Union Wage Differentials for Covered Members and Nonmembers in Great Britain”. *Journal of Labor Research*, 21, (2000), pp.133–145.

“Understanding the Labour Market: Matching Workers and Employers Using Respondent Level Data from Government Surveys.” With S. E. Pudney. *Labour Market Trends*, 106, Number 12, (1998), pp. 643–656.

“The Ambiguity of Verdoorn’s Law: A Case of the British Regions.” *Journal of Post-Keynesian Economics*, 11, (1988–1989), pp. 279–294.

Chapters in books

“Aspetti econometrici nell’ analisi di studi ‘cross-section’ con dati su lavoratori e datori di lavoro.” With S. E. Pudney. *Micro and Macrodatta of Firms*, Biffandini, S. (ed), Springer-Verlag, Germany, (1999), pp. 509–540.

“Econometric Issues in the Analysis of Linked Worker-Employer Cross-Section Surveys.” With S. E. Pudney. *The Creation and Analysis of Employer and Employee Matched Data*, Haltiwanger, J. C., Lane, Spletzer, J., J., Theeuwes, J., and Troske, K., eds, North-Holland, Amsterdam, (1999).

Book reviews

Job Creation and Destruction, by Davis, S. J., Haltiwanger, J. C., and Schuh, S., (Camb, MIT, 1996) in *Industrial and Labor Relations Review*, 51, 1997, pp. 143–145.

INVITED LECTURES AND KEYNOTE SPEECHES

January 1993: Measurement and Analysis of Vacancies: An International Comparison. University of Limburg, Netherlands.

February 1993: Australian Labour Market Workshop. Fremantle, Australia. Keynote Paper: "Design, Implementation, and Uses of the European Establishment Panel Survey.

June 1993: International Conference on Establishment Surveys. Buffalo, New York, USA. Invited Paper: "Economists Use of Establishment Data."

December 1994: Microeconomics of Human Resource Management: Multinational Studies of Firm Practices. Ministere de l' Economie, Paris, France. Invited Paper: "Unions and Employment: Evidence from US and UK Company Panels."

May 1995: The Effects of Advanced Technologies and Innovation on Firm Performance and Employment. U.S. Department of Commerce, Washington, DC, USA. Invited Paper: "Rent-Sharing and Wages: Product Demand or Technology Driven Premia?"

June 1996: International Conference on Comparative Analysis of Enterprise Data, Statistics Finland, Helsinki, Finland. Invited Paper: "Approaches to International Comparisons."

December 1997: International Conference on Comparative Analysis of Enterprise Data, Department of Mathematics & Statistics, University of Bergamo, Italy. Invited Paper: "Econometric Issues in the Analysis of Linked Worker-Employer Cross-Section Surveys."

May 1998: International Symposium on Employer-Employee Matched Data, Department of Commerce & Bureau of the Census, Washington, DC, USA. Invited Paper: "Econometric Issues in the Analysis of Linked Worker-Employer Cross-Section Surveys."

August 2001: 53rd Session of the International Statistical Institute (ISI), Seoul, Korea. Invited Paper: "Econometric Issues in the Analysis of Linked Worker-Employer Longitudinal Surveys."

October 2003: Committee on National Statistics (CNSTAT) Workshop: Access to Research Data: Assessing Risks and Opportunities. National Academy of Science, Washington DC. Commissioned Paper: "The Census Research Data Center Network: Problems, Possibilities and Precedents."

September 2005: Department of Trade and Industry (DTI)/Policy Studies Institute (PSI) Conference: Making Linked Employer-Employee Data Relevant to Policy Analysis. The British Academy, London. Commissioned Paper: "On the Importance of Measurement Error in Estimating Displacement and the Cost of Job Loss: Lessons using Matched Employer-Employee Data."

PRESENTATIONS

Royal Economic Society Meeting, University of Kent, 1995.

Econometric Society Summer Meeting, University of Iowa, Iowa City, 1996.

Econometric Society Summer Meeting, California Institute of Technology, Pasadena, 1997.

Econometric Society World Congress, University of Washington, Seattle, 2000.

APPENDIX B
DOCUMENTS RELIED UPON

- Amended Class Action Complaint
- Expert Report of Jonathan I. Arnold, Ph.D, May 4, 2015
- Expert Reply Report of Jonathan I. Arnold, Ph.D, July 15, 2015
- Corrected Rebuttal Report of Marc. B. Sherman, June 25, 2015
- Figurebook.xlsx (Excel book containing the data behind the results described in Dr. Arnold and Mr. Sherman's expert reports)
- Plaintiffs Data for Regression – A&M Recreation.xlsx (Excel book containing Alvarez and Marsal's recreation of the data reportedly used in the Plaintiffs' Amended Complaint)
- BA-PLTF-000091
- P. A. Samuelson, T. C. Koopmans, and J. R. N. Stone (1954). "Report of the Evaluative Committee for Econometrica," *Econometrica* 22(2)
- Paul A. Samuelson and William D. Nordhaus, 2004. *Economics*. 18th ed., McGraw-Hill
- Gujarati, D.N. and Porter, D.C. *Essentials of Econometrics*, 4th edition, McGraw-Hill, 2010.
- Spearman C (1904). "The Proof And Measurement Of Association Between Two Things." *American Journal of Psychology*. 15